

IN THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended) An optical cavity structure, comprising:

an input port for receiving input optical signals from a first waveguide;

a three dimensional ~~interconnecting~~ high transmission cavity structure that receives said input optical signals and interconnects said first waveguide to a second waveguide, said three dimensional high transmission cavity~~interconnecting~~ structure includes at least four straight edges that are orthogonal and of a finite width and thickness; and

an output port coupled to said three dimensional high transmission cavity~~interconnecting~~ structure for providing said second waveguide with said input optical signals.

2. (Currently Amended) The optical cavity structure of claim 1, wherein the three dimensional high transmission cavity~~interconnecting~~ structure reflects said input optical signals at a 45 degree angle.

3. (Currently Amended) The optical cavity structure of claim 2, wherein the three dimensional high transmission cavity~~interconnecting~~ structure interconnects said first and second waveguides at 90 degrees.

4. (Currently Amended) The optical cavity structure of claim 3, wherein said three dimensional high transmission cavity~~interconnecting~~ structure is a five-sided polygon.

1 5. (Currently Amended) The optical cavity structure of claim 4, wherein the three dimensional  
2 high transmission cavity~~interconnecting~~ structure includes a fifth side that is aligned at an angles  
3 135 degrees from both of its respective sides.

1 6. (Original) The optical cavity structure of claim 5, wherein said first waveguide and second  
2 waveguide are polySi waveguides.

1 7. (Original) The optical cavity structure of claim 5, wherein said first waveguide and second  
2 waveguide are SOI waveguides.

1 8. (Currently Aamended) The optical cavity structure of claim 7, wherein said three dimensional  
2 high transmission cavity~~interconnecting~~ structure is etched using anisotropic etching.

1 9. (Previously Presented) An optical splitter device, comprising  
2 an input port for receiving input optical signals from an input waveguide; and  
3 a three dimensional splitting structure that receives said input optical signals and  
4 split said input optical signals into at least two separate signals that are directed to at least  
5 two output waveguides, said three dimensional splitting structure includes at least two  
6 separate optical cavities connected to their sides, wherein each of said optical cavities  
7 includes at least four straight edge sides that are orthogonal with a finite width and  
8 thickness.

1 10. (Previously Presented) The method of claim 9, wherein said three dimensional splitting  
2 structure is a T-shaped structure.

1 11. (Original) The optical splitter device of claim 10, wherein said first waveguide and said at  
2 least two output waveguides are polySi waveguides.

1 12. (Original) The optical splitter device of claim 10, said first waveguide and said at least two  
2 output waveguides are SOI waveguides.

1 13. (Original) The optical splitter device of claim 10, wherein said optical cavities are etched  
2 using anisotropic etching.

1 14. (Previously Presented) The optical splitter device of claim 10, wherein the SOI waveguides  
2 have a silicon core.

1 15. (Original) The optical splitter device of claim 14, wherein the SOI waveguides have  
2 cladding of silica and top cladding of air.

1 16. (Original) The optical splitter device of claim 13, wherein the polySi waveguides have a  
2 silicon core.

1 17. (Original) The optical splitter device of claim 16, wherein the polySi waveguides have  
2 cladding of silica and top cladding of air.

1 18. (Previously Presented) The optical splitter device of claim 10, wherein the three dimensional  
2 splitting structure is Y-shaped.

1 19. (Original) The optical splitter device of claim 18, wherein said at least two optical cavities  
2 form a seven sided polygon.

1 20. (Original) The optical splitter device of claim 19, wherein said seven sided polygon includes  
2 five straight edge sides that are orthogonal.

1 21. (Original) The optical splitter device of claim 20, wherein the seven sided polygon includes  
2 two sides that are aligned at angles of 135 degrees and 270 degrees with their respective adjacent  
3 sides.

1 22. (Original) The optical splitter device of claim 21, wherein said first waveguide and said at  
2 least two output waveguides are polySi waveguides.

1 23. (Original) The optical splitter device of claim 21, said first waveguide and said at least two  
2 output waveguides are SOI waveguides.

1 24. (Original) The optical splitter device of claim 21, wherein said optical cavities are etched  
2 using anisotropic etching.

1 25. (Original) The optical splitter device of claim 23, wherein the SOI waveguides have a silicon  
2 core

1 26. (Original) The optical splitter device of claim 25, wherein the SOI waveguides have  
2 cladding of silica and top cladding of air.

1 27. (Original) The optical splitter device of claim 22, wherein the polySi waveguides have a  
2 silicon core

1 28. (Original) The optical splitter device of claim 27, wherein the polySi waveguides have  
2 cladding of silica and top cladding of air.

1 29. (Currently Amended) An optical resonator, comprising:

2 a plurality of straight waveguides; and

3 a plurality of three dimensional high transmission cavity~~interconnecting~~ elements for  
4 interconnecting said plurality of straight waveguides to form said optical resonator, wherein said  
5 three dimensional interconnecting elements include at least four straight edges that are  
6 orthogonal and of a finite width and thickness.

1 30. (Currently Amended) The optical cavity structure of claim 29, wherein said three  
2 dimensional high transmission cavity ~~interconnecting~~ elements are five-sided polygons.

1 31. (Original) The optical cavity structure of claim 30, wherein the five-sided polygons each  
2 include a fifth side that is aligned at an angles 135 degrees from both of its respective sides.

1 32. (Original) The optical cavity structure of claim 31, wherein said plurality of waveguides are  
2 polySi waveguides.

1 33. (Original) The optical cavity structure of claim 31, wherein said plurality of waveguides are  
2 SOI waveguides.

1 34. (Currently Amended) The optical cavity structure of claim 33, wherein said three  
2 dimensional high transmission cavity~~interconnecting~~ elements are etched using anisotropic  
3 etching.